




# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,060	02/26/2002	Kyle Spring	IR-1821 (2-2833)	4378
2352	7590	07/01/2004	EXAMINER	
OSTROLENK FABER GERB & SOFFEN 1180 AVENUE OF THE AMERICAS NEW YORK, NY 100368403			RAO, SHRINIVAS H	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/083,060	SPRING ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Steven H. Rao	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 11-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 11-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 May 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of paper submitted under 35 U.S. C. 35 U.S.C. 120 claiming priority from U. .S. Serial No. 10/083060 filed on February 26, 2002 which itself claims priority from provisional Application No. 60/271550 filed on February 26, 2001 which papers have been placed of record in the file.

### ***Request for Continued Examination Application ( RCE)***

The request filed on 03/15/2004 for a Request for Continued Examination Application (RCE) under 37 CFR 1.114 based on parent Application No. 10/083060 is acceptable and a RCE has been established. An action on the RCE follows.

### ***Information Disclosure Statement***

No Ids has been filed to date in the present application.

### ***Preliminary Amendment Status***

Acknowledgment is made of entry of preliminary amendment filed on March /15 /2004 has been entered on March 25, 2004 and the Supplemental Amendment faxed on May 19, 2004 and entry authorized by fax on May 28, 2004 has been entered on May 28, 2004.

Art Unit: 2814

Therefore claims 11 to 18 as recited in the supplemental amendment are currently pending in the application.

Claims 1-10 have been cancelled by the amendment.

### ***Specification***

#### ***Drawings***

The drawings replacement sheet 1 were received on May 19, 2004 .

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, these drawings are objected to because these amended drawings do not show the presently claimed channel region (described in the specification as reference numeral 25) and also the source contact (claim 18) (described in the specification as Aluminum source contact 32 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief

Art Unit: 2814

description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 11 to 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 11 recites in relevant parts " an epitaxially grown silicon layer , the specification as originally filed only describes an epi layer without specifying it as a silicon layer.

Art Unit: 2814

Further claim 11 also recites “ a silicon substrate”, the specification as originally filed only describes a substrate without specifying it as a silicon substrate .

Claims 12-18 are rejected at least for depending upon a rejected claim 11.

Appropriate correction is required.

### **Claim Objections**

Claim 18 is objected to for the following reasons :

It is believed that Applicants' recitation herein “of an oxide interlayer “ is shown in figure as element 27 and may be recited as “over said gate structure “ instead of “ over said active area” to clearly distinguish it from elements 14 and 15 over the active area.

Similarly in line 3 the last three words herein “ over said active area” can be replaced by “ over said oxide interlayer and a heavy base region”.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11-12 and 14 to 18 are rejected under 35 U.S.C. 102 (b) as being anticipated by Hshieh et al. ( U.S. Patent No. 5,907,776, herein after Hshieh) .

Art Unit: 2814

With respect to claim 11 Hsieh describes a process for manufacturing a planar power semiconductor device comprising: providing a semiconductor die including an epitaxially grown silicon layer of a first conductivity formed over a silicon substrate (Hsieh fig. 3, # 52 col. 4 lines 40-47) designating an active-area, ( Hsieh fig. 3 # 50, col. 4 lines 54-55) said active area being a portion of said epitaxially grown silicon layer in which channel regions are formed ( Hsieh fig. 3 # 80 ) implanting dopants of a second conductivity in all of said active area of said epitaxially grown silicon layer; ( Hsieh col. 6 lines 55-61) forming a plurality of spaced channel regions of said second conductivity in said active area of said epitaxially grown silicon layer each channel region being spaced from another channel region by a first conductivity region in said epitaxially grown silicon layer ; ( Hsieh figure 3 # 62) forming a source region of said first conductivity in each of said channel regions, each source region being less wide and less deep than a channel region in which it is formed; ( Hsieh figure 3 # 48, less wide/deep than 80 ) and forming a lateral gate structure over each lateral channel; ( Hsieh –figure 3 ,Mosfet cell and col.8 lines 60-68) wherein said first region of said epitaxially grown silicon is selected to cover an entire active region of said device. ( Hsieh figure 3).

With respect to claim 12 Hsieh describes a process according to claim 11, further comprising forming a field oxide termination structure at the edge of said active region prior to said implanting step.( Hsieh fig. 7 L # 56)

With respect to claim 14 Hsieh describes a process according to claim 11, wherein said gate structure comprises a gate oxide, said gate oxide being formed after said implanting step. ( Hsieh fig. 7 N).

With respect to claim 15 Hsieh describes a process according to claim 12, wherein said field oxide is formed over said epitaxially grown silicon and etched to provide a window over said first region, wherein said dopants of said second conductivity are implanted through said window.( Hsieh figs. 7I and 7 L)

With respect to claim 16 Hsieh describes a process according to claim 11, wherein said dopants of said second conductivity are comprised of boron. ( Hsieh figure 7 I-B)

With respect to claim 17 Hsieh describes a process according to claim 11, wherein said dopants of said second conductivity type are comprised of either arsenic or phosphorous. ( Hsieh figure 7 L-P).

With respect to claim 18. Hsieh describes a process according to claim 11, further comprising, forming an oxide interlayer over said active region; opening windows over at least said source regions; and forming a source contact over said active region. ( Hsieh figure 7N and M # 58).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:



Art Unit: 2814

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hshieh et al. ( U.S. Patent No. 5,907,776, herein after Hshieh) .

With respect to claim 13 Hsieh describes a process according to claim 11, further comprising forming a field oxide termination structure at the edge of said active region after said implanting step..( Hsieh fig. 7 L # 56). It is noted that selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. In re Burhaus, 154 F.2d. 690, 69 USPQ 330 ( CCPA1946) , see also Ex parte Rubin, 126 USPQ 440 (BAPi1959).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (571) 272-1718 . The examiner can normally be reached on 8.00 to 5.00.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/083,060

Page 9

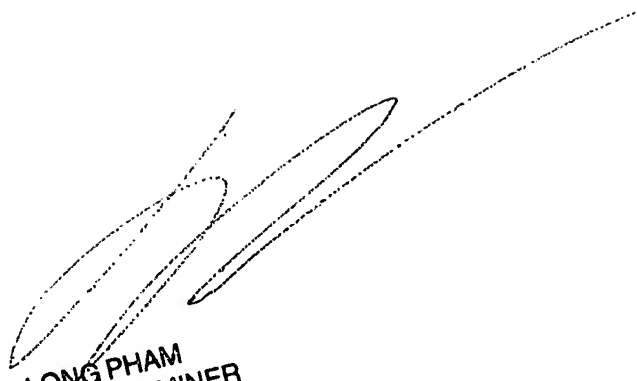
Art Unit: 2814



Steven H. Rao

Patent Examiner

June 18, 2004.



LONG PHAM  
PRIMARY EXAMINER